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PHYTATE AND SELECTED MINERAL COMPOSITION OF FOLIAGES FROM SOME ORNAMENTAL PLANTS

Kayode B.O[1] and Esiet E.E[2]
[1]Department of Horticulture, [2]Department of Agricultural Economics Federal College of Agriculture, Akure, Ondo State.

ABSTRACT
The leaves selected mineral and phytate contents of foliages of ornamented plants were determined during the 2001 rainy season in order to ascertain their suitability as feed source. Mineral contents should high variability within varieties especially in K, Ca, Na and Mg. the ranges (mg/100gDM) of other minerals were Zn (0.74 – 1.87), fe (0.96 – 2.48), Mn (0.53 – 2.52) and Cu (ND – 0.81). The levels of phytate and phytate phosphorus were generally high. Nine of the samples had more than 50% of their total phosphorus linked to phytate. Mineral and phytate level of all samples indicate better or similar results as compared to vegetables.

KEYWORDS: phytate, selected mineral, ornamental plants.

INTRODUCTION
Ornamental plants developed early in history for its is known that primitive peoples planted them near their dwellings. They have been selected from virtually the whole kingdom of plants. Types of plants in clued trurfgrass, shrubs, deciduous trees, bamboos, aquatic plants and shade plants just to mention a few. Large decorative foliage plants are used extensively in homes and offices (Encyclopedia, 1987).

Ruminant animals have a unique ability to thrive on a wide range of diet from our observation we found out that these animals feed on foliages of ornamental plants. However, information on the nutritive values of these plants is scare. It is therefore the aim of this paper to give extensive report on mineral and phytate contents of the foliages of the ornamental plants.

MATERIALS AND METHODS
The different foliages of different varieties of 12 ornamental plants were collected during the 2001 rainy season at federal college of Agriculture, Akure, Ondo State. 100g lots of the samples were washed in distilled water, oven dried at 60^0C for 16hr, then finely ground in a Kenwood blender, served (1mm sieve) and mixed thoroughly. After mixing the sample lots were quartered and sampling for analysis was carried out by the procedure described by Pearson (1976). The determination of minerals was as follows: 0.6g of each of the samples were dry-ashed for 2hr at 550^0C. The ashed samples were dissolved in distilled water (fire drops of conc. HCl added) and made up to 100mls with distilled water. In the solution prepared, mineral determinations were done using a Perkin Elmer atomic absorption spectrophotometer (model 372). Total phosphorus (P) was determined colorimetrically by the phosphovanadomolybdate method (AOAC, 1990). Extraction and precipitation procedures of samples for phytate were done by the method of Young and Greaves (1940) and estimation of phytate-P and phytate were calculated by multiplying phytate-P by a factor of 3.55 as described by Abulude (2001)

RESULTS AND DISCUSSION
Table 1 gives the average concentration of elements on a dry basis in the samples analyzed. Some general inferences may be derived from this table. Except for Mn and Cu, the remaining elements have a higher trend of occurrence in all the samples. The inorganic matrix in all the samples are primarily comprised of Na, Mg, K and Ca. all these show the mineral rich of foliage of ornamental plants. It may be note that all the samples contain appreciable amount of Zn. They contain significant amount of Fe similar results are recorded by several authors (Gupta and Wagle, 1988, Trugo *et al*, 1993, Tomori and Obijole, 2000 and Abulude, 2001).

Table 1. Mineral concentrations of foliage samples under investigation (mg/100g dry matter).

Botanical names	common	Zn	Na	Mg	K	Ca	Fe	Cu	Mn	
1. *Azadirachta indicia*	Neem		1.87	45	92	976	170	2.24	ND	0.94
2.*Casuarina equisetifolia*	Whistling pine		0.78	62	126	827	253	1.87	ND	1.21
3. *Eucalyptus* citriodora	Blue gum		0.84	124	134	925	342	1.72	0.71	0.87
4. *Cassiva multijuga*	cassia		1.24	254	101	576	226	1.62	ND	0.53
5. *Delonix regia*	Flame of the forest		1.33	60	132	334	577	2.34	0.28	0.79
6. *Gliricidia maculata*	Gliricidia		1.21	84	140	585	621	2.48	ND	1.10
7. *Acalypha spp*	Acalypha		0.98	90	224	958	431	0.98	0.50	2.52
8. *Acalypha*	Acalypha		0.74	78	168	487	427	1.26	ND	1.31
9. *Duranta repens*	Duranta	0.82	210	98	684	243	2.44	0.81	0.92	
10. *Hibiscus spp*	Hibiscus	0.75	124	75	437	439	1.97	0.35	0.82	
11. *Ixora spp*	Ixora		1.22	89	281	314	657	2.75	ND	0.97
12. *Ananas sativus variegates*	Ananas		1.12	128	197	837	388	0.96	0.55	1.88
Mean			1.08	112.3	147	661	397	1.89	0.53	1.16
Standard deviation			0.33	62.5	60.6	240.6	160.2	0.60	0.20	0.55
Coeff of variation			30.72	55.6	41.2	36.4	40.3	31.75	38.15	47.22

It is found in Table 1 that for some of the elements, the width of the concentration is considerably large. This may be due to several factors that include soil condition, fertilizer humidity, irrigation, water quality etc. all these together resulted into high standard deviation values. The presence of high level of minerals in the foliage may results in good nutritive value when consumed or fed to animals.

Table2 depicts total p, phytate-p, phytate and phytate-p expressed as percentage. The levels of total P are generally high (197-23mg/100g) and similar to those recorded earlier (Uzuegbu, 1993; Aletor, 1995), but higher than those reported for *Amaranttus spp* (0.04%) and Bagasse (0.06%) (Aduku, 1993). Phytate P is highest in *Acalyha spp* (210mg/100g) and lowest in *Gliricidia* (110mg/100g). These values are similar or in agreement with the concentrations found in vegetables (Abulude, 2001). The levels of phytate are generally high. These results compares well with the results obtained for some lesser known leguminous crops, seeds and foliages (Balogun and Fetuga, 1989, Oduguwa *et al*, 1999) and varieties of lupuin seeds (Trugo *et al*, 1993). The high phytate in the samples may have significant effects on the utilization of divalent minerals and also render unavailable some essential amino- acids. Zn is the most affected as demonstrated by several studies both in animals and humans (Sandstrom, 1988).

Phytate P expressed as percentage of total P ranged between 36.6 – 70.6% (only three samples show less than 50%). The nutritional implication of such high phytate P results on the fact that monogastric animals lack phytase, which can break down phytate to release phosphorus for utilization) Balogun and fetuga, 1989).

Table 2: Total P, phytate-P, phytate and phytate-P expressed as percentage

Botanical names	Common (Mg/100g)	Total P Mg/100g)	Phytate P (Mg/100g)	Phytate (% of total P)	Phytate P
1. *Azadirachta indicia*	Neem	320	200	710	62.5
2.*Casuarina equisetifolia*	Whistling pine	282	187	664	66.3
3. *Eucalyptus citriodora*	Blue gum	289	204	724	70.6
4. *Cassiva multijuga*	cassia	300	178	632	59.3
5. *Delonix regia*	Flame of the forest	287	167	593	58.2
6. *Gliricidia maculata*	Gliricidia	301	110	391	36.6
7. *Acalypha spp*	Acalypha	298	210	746	70.5
8. *Acalypha*	Acalypha	224	154	547	68.8
9. *Duranta repens*	Duranta	272	162	575	59.6
10. *Hibiscus spp*	Hibiscus	197	122	433	61.9
11. *Ixora spp*	Ixora	310	134	476	43.2
12. *Ananas sativus variegates*	Ananas	304	116	412	38.2
Mean		282	162	575.3	57.8
Standard deviation		36.2	35.2	125.2	12.1
Coeff of variation		12.8	21.8	21.8	20.9

CONCLUSION

From the results obtained, it can be concluded that the samples contained high mineral values and the levels of phytate are unlikely to have any adverse effects on ruminants but can be dietary advantage for the monogastric whose gastrointestinal tract lacks phytase enzyme.

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Corresponding Author:
Kayode B.O
Department of Horticulture, Federal College of Agriculture, Akure 340001, Ondo State, Nigeria.